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Neu eingegangene Arbeiten

W. Dilg and W. Mannhart, Physik-Department E 14, Technische Universität München:
Neutron Total Cross Sections of Sc, V, Cu and Rh at μeV Energies

Neutron total cross sections of the elements Sc, V, Cu and Rh have been measured for energies 8–500 μeV using the ultracold neutron time-of-flight spectrometer [1] at the Munich research reactor FRM. $1/v$-fits to the total cross sections were carried out, and capture cross sections evaluated with correction for the small contributions of incoherent-elastic and thermal-inelastic scattering. Evaluation of the 2200 m/s capture cross sections gave, Sc, (27.54 ± 0.20) b, V, (5.08 ± 0.025) b, Cu, (3.77 ± 0.025) b, Rh, (144.8 ± 0.7) b. Combining the present estimate of copper and the value (2.17 ± 0.03) b reported for ^{65}Cu by Ryves [2], one obtains (4.49 ± 0.04) b for the 2200 m/s capture cross section of ^{63}Cu.

H. Liening, Physikalisches Institut der Universität Tübingen:
Lebensdauer- und Hyperfeinstrukturmessungen an einigen angeregten Zuständen der Konfiguration $4d^9\,5p$ im Pd I-Spektrum mit der Level-crossing Methode (Lifetime and Hyperfine Structure Measurements of Some Excited States of the $4d^9\,5p$ Configuration in the Pd I-Spectrum with the Level Crossing Technique)

Lifetimes and hfs coupling constants of some excited states of the $4d^9\,5p$ configuration of Pd I have been determined in a level crossing experiment by observing the field dependence of the polarization of the fluorescence radiation in a magnetic field.

From the halfwidths of the measured zero field level crossing signals one obtains the mean lifetimes of the following fine structure states:

$$\tau(^3P_1^0) = (7.46 \pm 0.32)\ \text{nsec}; \quad \tau(^3P_2^0) = (6.9\ \pm 0.76)\ \text{nsec}$$
$$\tau(^1P_1^0) = (4.99 \pm 0.35)\ \text{nsec}; \quad \tau(^3D_1^0) = (4.89 \pm 0.40)\ \text{nsec}$$
$$\tau(^3D_3^0) = (6.99 \pm 0.49)\ \text{nsec}; \quad \tau(^3F_4^0) = (7.09 \pm 0.46)\ \text{nsec}.$$

$\Delta m = 2$ crossing signals were detected in the $^3P_1^0$, $^3D_3^0$ and $^3F_4^0$-states of the odd isotope ^{105}Pd. A detailed analysis of the experimental curves yields the hfs coupling constants A and B of these states:

$$A(^3P_1^0) = -(133 \pm\ 2)\ \text{Mc/sec}; \quad B(^3P_1^0) = \ (140 \pm\ 30)\ \text{Mc/sec}$$
$$A(^3D_3^0) = -(120 \pm 10)\ \text{Mc/sec}; \quad B(^3D_3^0) = -(660 \pm 100)\ \text{Mc/sec}$$
$$A(^3F_4^0) = -\ (87 \pm\ 2)\ \text{Mc/sec}; \quad B(^3F_4^0) = -(330 \pm\ 30)\ \text{Mc/sec}.$$

A theoretical calculation of the hfs constans is given on the basis of reduced matrix elements. Within the limit of the errors these values agree with the experimental ones.

The nuclear electric quadrupole moment deduced from the measured B values is $Q(^{105}\text{Pd}) = (0.8 \pm 0.3) \cdot 10^{-24}\ \text{cm}^2$ (without corrections).

E. Roeckl, D. Lode, W. Pessara and The ISOLDE Collaboration, CERN, Geneva Switzerland:

The Decay of ^{75}Kr

The decay of the isotope ^{75}Kr ($T_{1/2}=4.5\pm0.3$ m) has been studied using mass separated sources produced at the ISOLDE facility at CERN. A decay scheme is proposed based on gamma, position, and conversion electron singles and coincidence measurements. The total decay energy was measured to be $Q_{EC}=4.4\pm0.2$ MeV. The resulting spin-parity assignments and the absence of a $9/2^+$ isomeric state in ^{75}Br are discussed.

D. Zawischa, Institut für Theoretische Physik der Technischen Universität Hannover:

Calculation of the Particle-Phonon Multiplets in ^{209}Bi

The multiplet energies are calculated using density dependent effective forces of the type proposed by Migdal. Very good agreement is obtained in the case of the septuplet. For the decuplet, the $(2j+1)$ rule for the cross sections is shown to be incorrect. The data obtained on the decuplet agree well with experiment if a new spin assignment is adopted. Results on the $h\ 9/2\times4^-$, $h\ 9/2\times5_2^-$ and $f\ 7/2\times3^-$ multiplets are also given.

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$\mathfrak{a}, \mathfrak{b}, \mathfrak{c}, \mathfrak{d}, \mathfrak{e}, \mathfrak{f}, \mathfrak{g}, \mathfrak{h}, \mathfrak{i}, \mathfrak{j}, \mathfrak{k}, \mathfrak{l}, \mathfrak{m}, \mathfrak{n}, \mathfrak{o}, \mathfrak{p}, \mathfrak{q}, \mathfrak{r}, \mathfrak{s}, \mathfrak{f}, \mathfrak{t}, \mathfrak{u}, \mathfrak{v}, \mathfrak{w}, \mathfrak{x}, \mathfrak{y}, \mathfrak{z}$

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preferred form	instead of
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$7/8, (a+b)/c$	$\frac{7}{8}, \frac{a+b}{c}$
$\frac{\cos(1/x)}{(a+b/x)^{1/2}}$	$\frac{\cos\frac{1}{x}}{\sqrt{a+\frac{b}{x}}}$
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Volume 5

Q-Values and Excitation Functions of Nuclear Reactions

Part a:

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Editor: H. Schopper

2 diagrams
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This volume, I/5 a, contains the reaction energies (Q-values) of nuclear reactions and the subsequent volumes, I/5 b and c, will contain a compilation of excitation functions.

Q-values were tabulated for reactions with up to eleven outgoing particles. As target nuclides all stable and some radioactive nuclides were included. As projectiles the most important nuclei up to medium nuclear masses were selected. Q-values not contained in the tables can be computed with the help of the tables of mass excesses at the end of thu volume.

The computation of the Q-values is based on the mass excesses from experimental data (Wapstra and Gove, 1971) or on the mass formula of Myers and Swiatecki, 1965 (★ in the tables).

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Projectiles:

γ	n	p	d	^{3}He	α	^{6}Li	^{7}Li	
^{10}B	^{11}B	^{12}C	^{14}N	^{16}O	^{18}O	^{19}F	^{20}Ne	
^{22}Ne	^{31}P	^{32}S	^{40}Ar	^{40}Ca	^{64}Zn	^{84}Kr	^{127}J	^{132}Xe

Table of mass excesses.

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